

Southern Company Services, Inc.**Smart Grid Project****Abstract**

The Southern Company Services' (Southern Company) Smart Grid project involves integrated upgrades of the distribution, transmission, and grid management systems throughout their large service territory. Major efforts include automation of major parts of the distribution system, automation of selected transmission lines, and new equipment for many substations. This project centers on deployment of new distribution technologies that intend to improve power factor at delivery, thereby increasing the effective usability of existing electricity generation. This reduction in line losses may lead to the deferral of new generation capacity investments and associated reductions in greenhouse gas emissions. The distribution automation equipment in this project also aims to enhance system reliability through better protections and faster response to outages while simultaneously lowering cost for operation and maintenance of the system by human operators.

Smart Grid Features

Communications infrastructure includes new radio communication equipment and upgrades to the outage management, distribution management, and supervisory control and data acquisition (SCADA) systems. These new software platforms enhance grid operator's visibility and control of new automated transmission and distribution equipment. A total of 110 radio towers are installed to provide a faster communications network, using a SCADA platform to connect real-time transmission and distribution monitoring capability with grid operators. Southern Company expects this upgraded communication and monitoring platform to enable more rapid responses and avoidance of outages.

Distribution automation systems include automated feeder switches, regulator controls, monitors, relays, capacitor banks, and remote fault indicators. Of the utility's 4,706 circuits, 321 are receiving new automation equipment. This equipment coordinates sensor data throughout the distribution grid to automatically and rapidly manage power quality, avert power disturbances, and quickly isolate outages. These distribution automation equipment will help reduce the occurrence and duration of power outages while deferring investment in new generation resources. Furthermore, automated distribution will improve operational efficiency of Southern Company's distribution grid and reduce costs and emissions maintenance by reducing equipment failures and truck visits.

At-A-Glance

Recipient: Southern Company Services

State: Georgia, Alabama, Mississippi, and Florida

NERC Region: SERC Reliability Corporation

Total Budget: \$330,130,482

Federal Share: \$164,527,160

Project Type: Electric Distribution Systems Electric
Transmission Systems

Equipment

- **Distribution Automation Equipment for 321 out of 4,706 Circuits**
 - Distribution Management System
 - Equipment Condition Monitors
 - Automated Distribution Circuit Switches
 - Automated Capacitors
 - Automated Voltage Regulators
- **Substation Automation Equipment for 359 of 3,325 Substations**
 - SCADA Communications Network
 - Smart Relays

Key Targeted Benefits

- Deferred Investment in Generation Capacity Expansion
- Improved Electric Service Reliability and Power Quality
- Reduced Operating and Maintenance Costs
- Reduced Costs from Equipment Failures and Distribution Line Losses
- Reduced Truck Fleet Fuel Usage
- Reduced Greenhouse Gas and Criteria Pollutant Emissions

Southern Company Services, Inc. (continued)

Distribution system energy efficiency improvements involve the integration of automated capacitors and voltage regulators with a capacitor health monitoring system. The automated capacitors improve voltage, volt ampere reactive (VAR) control, and power quality, and increase distribution capacity by reducing energy losses on the distribution system.

Transmission system automation includes 458 automated switches along transmission lines and new monitors, relays, and breakers at transmission substations. This equipment provides the capability to automatically monitor the transmission network, to avoid potential developing power disturbances, and to isolate serious power outages. Similar to Southern Company's goals for this project's distribution automation activities, the transmission automation work aims to enhance system reliability while reducing the costs of maintenance and equipment failures.

Timeline

Key Milestones	Target Dates
Transmission line automation complete	Q4 2012
SCADA/distribution management system platform installation complete	Q1 2013
Distribution automation complete	Q2 2013

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